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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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EXAMINER

BROADHEAD, BRIAN J

ART UNIT

PAPER NUMBER

3661

DATE MAILED: 12/01/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/585,192

Applicant(s)

ZAHM ET AL.

Examiner

Brian J. Broadhead

Art Unit

3661

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 July 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-29 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 April 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 1 through 29 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. There is no support in the originally filed specification for the limitation "wherein the heading is aligned with the direction of travel of the locomotive based on whether the locomotive is orientated in a cab forward or cab reverse orientation of travel".

Claim Rejections - 35 USC § 101

3. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claim 4 is rejected under 35 U.S.C. 101 because the disclosed invention is inoperative and therefore lacks utility. The claim recites a formula for calculating heading rate that is inoperative. The formula would calculate pitch, not heading rate.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

Art Unit: 3661

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 1, 2, 5-9, 12-16, 19-23, 28, and 29 are rejected under 35 U.S.C. 103(a)

as being unpatentable over Bidaud, 6347265, in view of Ford, 6211821.

2. Bidaud discloses determining at least one of motion and location parameters of a locomotive including pitch, yaw(heading), and a rate of yaw(curvature) on lines 22-55, on column 3; determining track curvature on lines 19-30, on column 5; the track curvature is determined from angular rotation and velocity on lines 20-30, on column 5; angular rotation is found from a gyro and vehicle speed from a tachometer on lines 20-30, on column 5; determining position of the locomotive on line 7, on column 5; accessing a track database of heading and grade on lines 1-126, on column 6; sampling latitude and longitude from satellite receivers and determining distance traveled by the locomotive on lines 7-12, on column 5; and using the formula for distance traveled or its equivalent and adding the sampled distances is inherent in Bidaud.

3. Bidaud does not disclose providing at least two satellite signal receivers on the locomotive at spaced locations along the length of the locomotive; determining a set of phase differences between satellite reference signals received by satellite receivers; and determining an accurate heading of the locomotive during normal locomotive transit operation using the set of phase differences between the satellite reference signals, wherein the locomotive is self-propelled or propelled in a consist with other locomotives, wherein the heading is aligned with the direction of travel of the locomotive and based on whether the locomotive is oriented in a cab forward or cab reverse orientation of

travel; determining a vector difference between two antennas mounted to the locomotive; and determining an attitude rate.

4. Ford teaches providing at least two satellite signal receivers on the vehicle at spaced locations along the length of the vehicle in figure 4; determining a set of phase differences between satellite reference signals received by satellite receivers on lines 43-50, on column 2; and determining an accurate heading of the vehicle during normal vehicle transit operation using the set of phase differences between the satellite reference signals, wherein the vehicle is self-propelled, wherein the heading is aligned with the direction of travel of the vehicle and based on whether the vehicle is oriented in a cab forward or cab reverse orientation of travel on lines 10-44, on column 33; and determining a vector difference between two antennas mounted to the vehicle on line 26, on column 3. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the teaching of Ford in the invention of Bidaud because such modification would provide a low cost and reliable alternative to a gyrocompass pair as stated by Ford on line 45, on column 1.

5. Ford and Bidaud do not disclose determining an attitude rate. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use calculate and attitude rate once the attitude was already determined because is it is instantly obvious and a design choice.

6. Claims 3, 4, 17, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bidaud, 6347265, in view of Ford, 6211821 as applied to claims 1, 2, 15, and 16 above, and further in view of Wilson, 6313788.

7. Bidaud and Ford disclose the limitations as set forth above. They do not explicitly disclose determining d using the equation in the claims. Wilson disclose using the equations in the claims to determine d on line 15, on column 9. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the equations of Wilson in the invention of Bidaud and Ford because such modification provides a mathematical way to determine d , or as more commonly know, the baseline vector.

8. Claims 10, 11, 24, 25, 26, and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bidaud, 6347265, in view of Ford, 6211821 as applied to claims 1, 5, 15, and 19 above, and further in view of Kumar, 5896947.

9. Bidaud and Ford disclose the limitations as set forth above. They do not disclose dispensing a track lubricant in accordance with the determined curvature and when the curvature exceeds a predetermined magnitude, or based on the curvature value contained in a track database. Kumar discloses dispensing a track lubricant in accordance with the determined curvature and when the curvature exceeds a predetermined magnitude on columns 1 and 2. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the curvature calculated by the invention of Bidaud and Ford to dispense the lubricant of Kumar because such modification would provide a source of the curvature value for Kumar. Kumar is silent as to how the curvature value is determined. Bidaud and Ford provide a way to determine curvature through GPS calculations, gyros, or track databases.

Response to Arguments

10. Applicant's arguments filed 7-13-05 have been fully considered but they are not persuasive. Applicant's arguments that the limitation of "aligning heading" is supported simply because it is familiar to one of ordinary skill in the art is not convincing. Just because something is familiar it does not mean that the invention as originally conceived was expected to work in that manner. Applicant's own specification also does not support aligning of the heading according to the direction of the locomotive since the heading is found directly from the found attitude which does not change according to travel direction. The attitude is a set value calculated between the two antenna positions. There is no mention of reversing the vector quantity d based on direction of travel.

11. Applicant's arguments with respect to claims 1, 2, 5-9, 12-16, 19, 23, 28, and 29 are also not convincing. Applicant has mischaracterized and/or misunderstood what Ford discloses. Ford does not describe only a method for using a multipath sensor if the system is stationary. What Ford discloses is a way to minimize the effect of multipath when using GPS receivers. The section Applicant refers to simply states that one of these techniques should not be used when moving. The rest of the invention reads on Applicant's invention as set forth above. The analysis of the reference is piecemeal.

12. Applicant's statement that Ford teaches away from the claimed invention is not supported by and supporting statements pointing out how the art teaches away.

13. Bidaud discloses determining track geometry using gyroscopes. Ford teaches replacing gyroscopes with a dual antenna or dual GPS receiver system. The GPS

system uses single difference calculations, just as Applicant discloses starting on line 19, on page 3 of the specification. It could be considered inherent that the equations of Wilson are used since Ford discloses this single difference method. Wilson describes the mathematical operations behind the single and double difference GPS methods. Ford also discloses on line 19, on column 3, the 180 degree phase difference(travel direction) that Applicant failed to disclose in their specification.

14. In response to applicant's arguments with respect to claim 15, the recitation "and reduce track wear" has not been given patentable weight because the recitation occurs in the preamble. A preamble is generally not accorded any patentable weight where it merely recites the purpose of a process or the intended use of a structure, and where the body of the claim does not depend on the preamble for completeness but, instead, the process steps or structural limitations are able to stand alone. See *In re Hirao*, 535 F.2d 67, 190 USPQ 15 (CCPA 1976) and *Kropa v. Robie*, 187 F.2d 150, 152, 88 USPQ 478, 481 (CCPA 1951).

15. In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

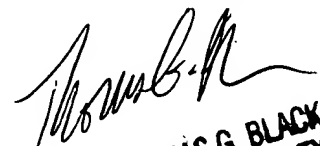
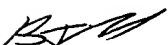
16. In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, Ford provides motivation since the GPS system is cheaper than gyroscopes, Wilson provides a way to calculate the differences that Ford discloses, and the combined system of Bidaud and Ford provide curvature values that the invention of Kumar needs to operate. Kumar fails to disclose a source for curvature in his disclosure.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian J. Broadhead whose telephone number is 571-272-6957. The examiner can normally be reached on Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas Black can be reached on 571-272-6956. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9306 for regular communications and (703) 872-9306 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-1113.



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